Fig. 1

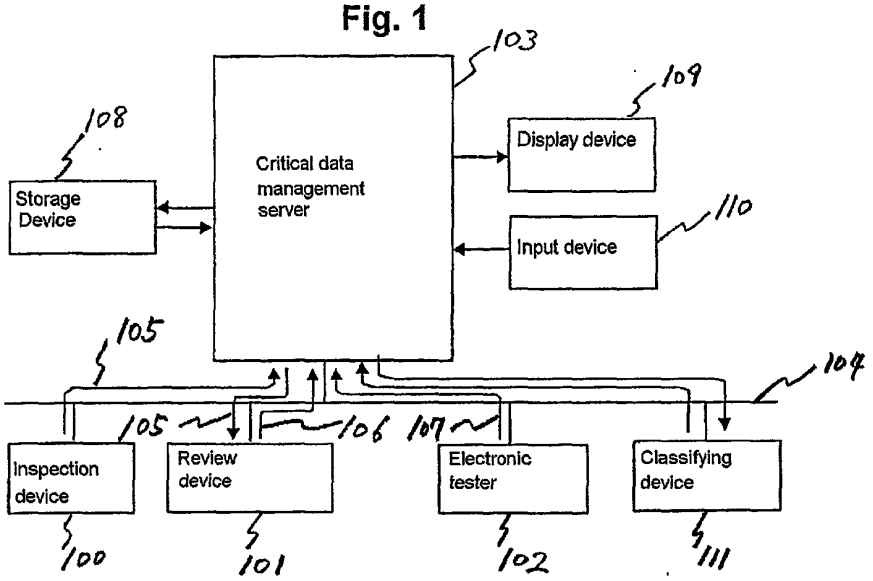

103
109
108
Critical data management server
Storage Device
Display device
110
Input device
105
107
105
106
107
Inspection device
Review device
Electronic tester
Classifying device
100
101
102
111

Fig. 3

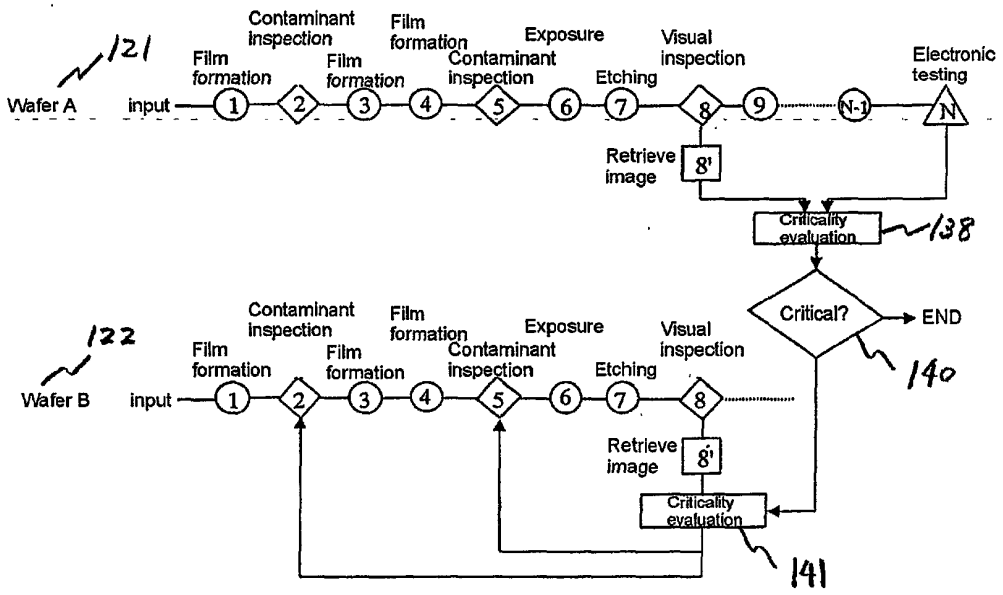

121
Wafer A
input
Film formation
Contaminant inspection
Film formation
Film formation
Contaminant inspection
Exposure
Etching
Visual inspection
Electronic testing
1
2
3
4
5
6
7
8
9
N-1
N
Retrieve image
8'
Criticality evaluation
138
Critical?
END
140
122
Wafer B
input
Film formation
Contaminant inspection
Film formation
Film formation
Contaminant inspection
Exposure
Etching
Visual inspection
1
2
3
4
5
6
7
8
Retrieve image
8'
Criticality evaluation
141

Fig. 2

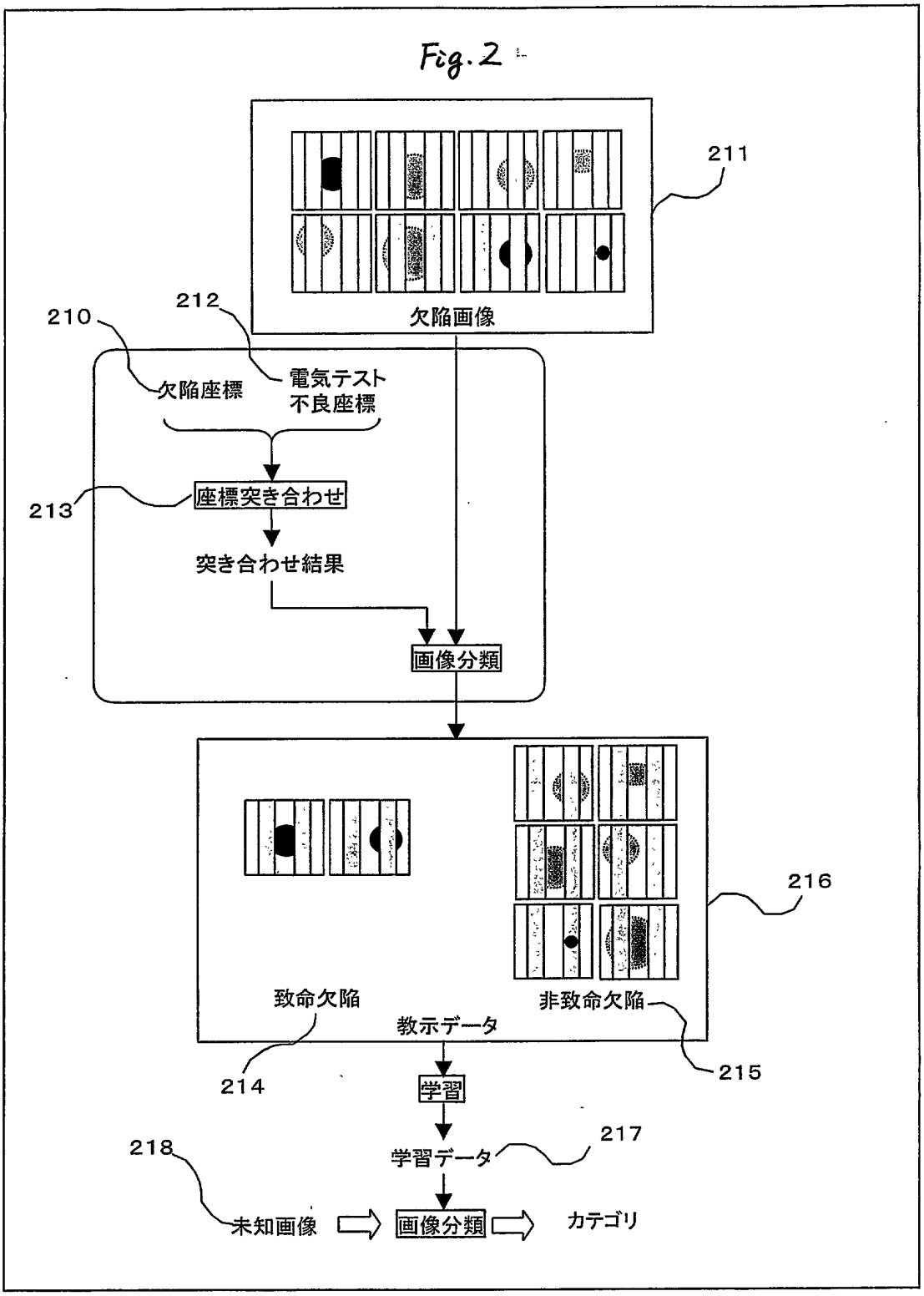

211
欠陥画像
212
210
欠陥座標
電気テスト
不良座標
213
座標突き合わせ
突き合わせ結果
画像分類
216
致命欠陥
非致命欠陥
教示データ
214
215
学習
217
学習データ
218
未知画像
画像分類
カテゴリ

Fig. 4

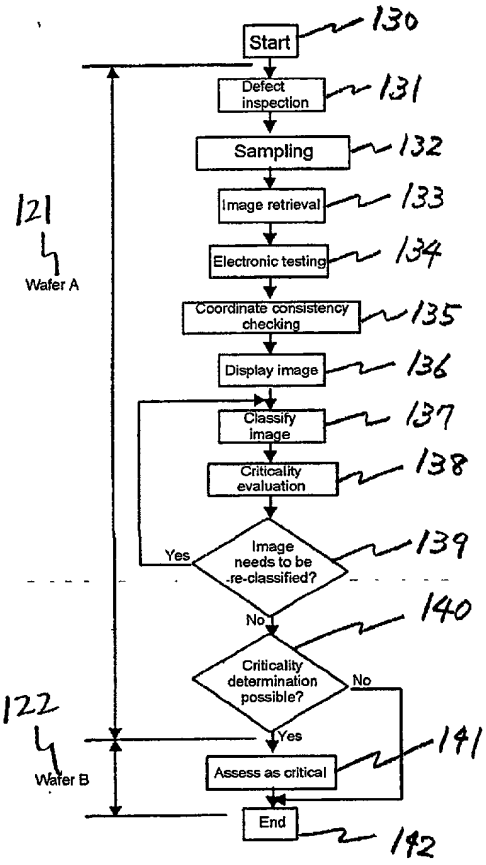

Start
130
Defect inspection
131
Sampling
132
Image retrieval
133
Electronic testing
134
Coordinate consistency checking
135
Display image
136
Classify image
137
Criticality evaluation
138
Image needs to be re-classified?
139
Yes
No
140
Criticality determination possible?
No
Yes
141
Assess as critical
End
142
121
Wafer A
122
Wafer B

Fig. 5

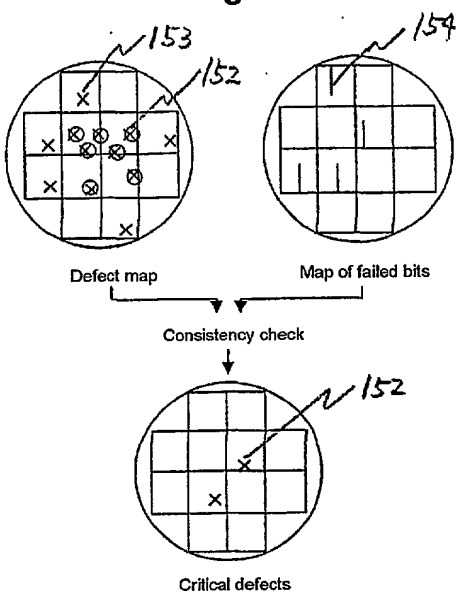


Fig. 6

160 Defect number	161 Chip coordinates	162 Defect coordinates	163 Sampling flag	164 Image name	165 Test result
1	(2,0)	(ΔX1, ΔY1)	0		G
2	(0,1)	(ΔX2, ΔY2)	0		G
3	(1,1)	(ΔX3, ΔY3)	1	image3	N
4	(2,1)	(ΔX4, ΔY4)	1	image4	N
5	(0,2)	(ΔX5, ΔY5)	0		G
6	(1,2)	(ΔX6, ΔY6)	1	image6	G
7	(1,2)	(ΔX7, ΔY7)	1	image7	G
8	(1,2)	(ΔX8, ΔY8)	1	image8	G
9	(2,2)	(ΔX9, ΔY9)	1	image9	N
10	(2,2)	(ΔX10, ΔY10)	1	image10	N
11	(3,2)	(ΔX11, ΔY11)	0		G
12	(1,3)	(ΔX12, ΔY12)	0		N

Fig. 7

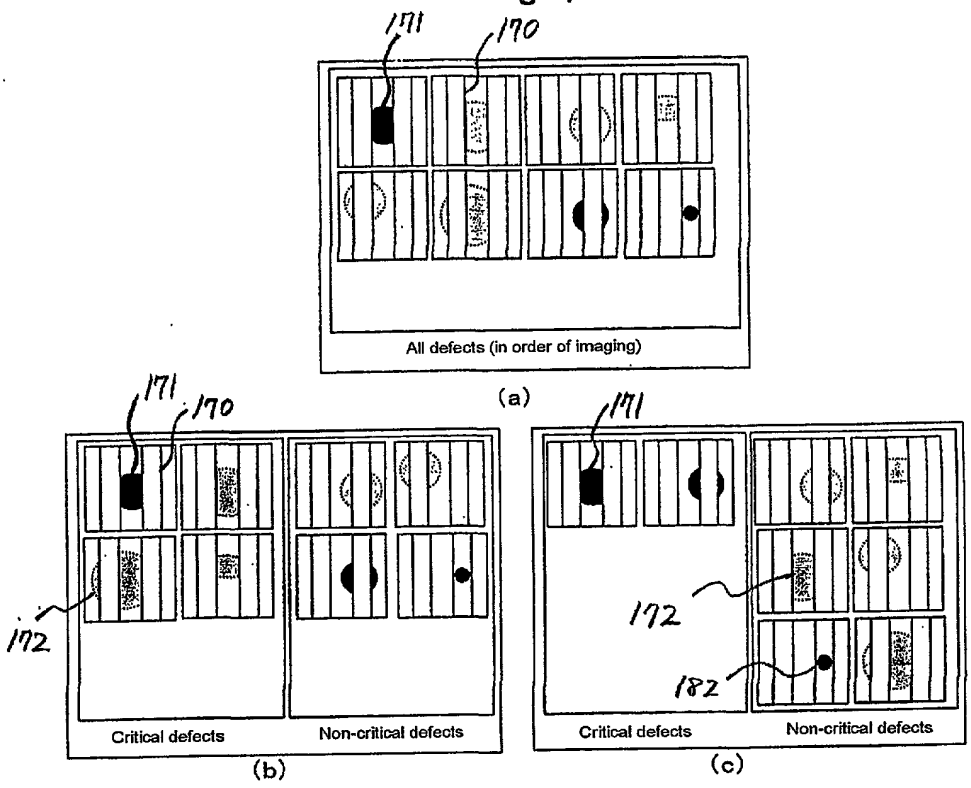

171
170
All defects (in order of imaging)
(a)
171
170
172
Critical defects
Non-critical defects
(b)
171
172
182
Critical defects
Non-critical defects
(c)

Fig. 9

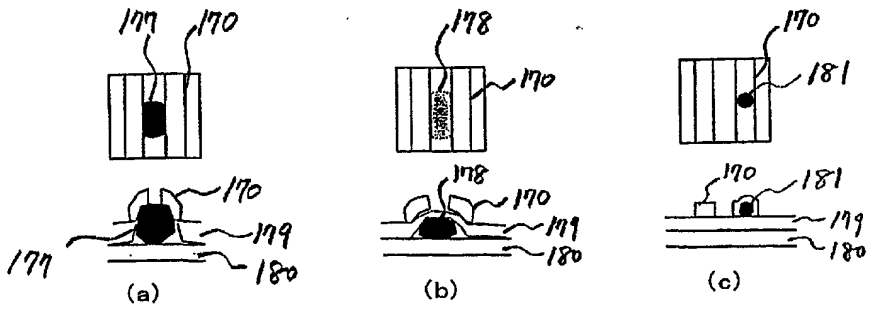

177
170
170
179
177
180
(a)
178
170
178
170
179
180
(b)
170
181
170
181
179
180
(c)

Fig. 8

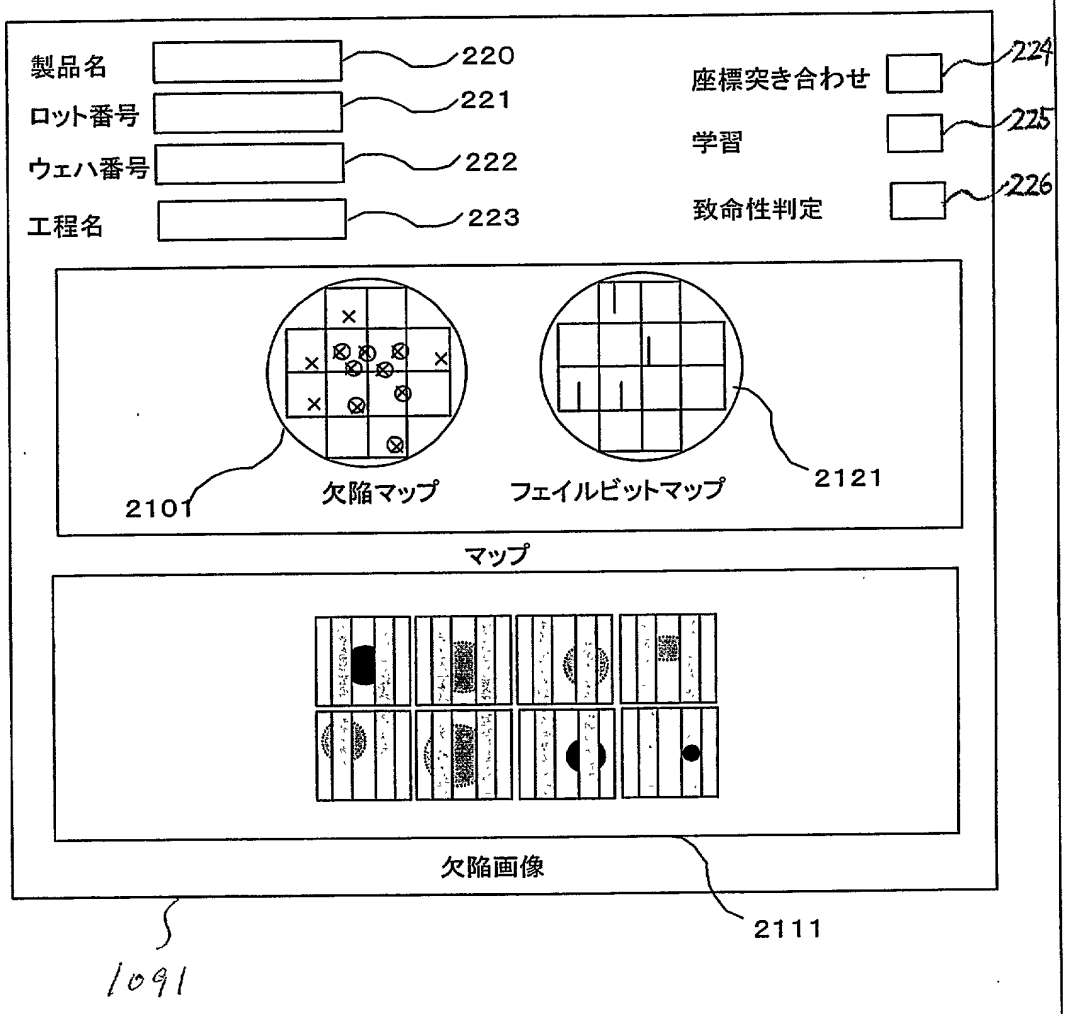

製品名
220
ロット番号
221
ウェハ番号
222
工程名
223
座標突き合わせ
224
学習
225
致命性判定
226
2101
欠陥マップ
フェイルビットマップ
2121
マップ
欠陥画像
2111
1091

Fig. 10

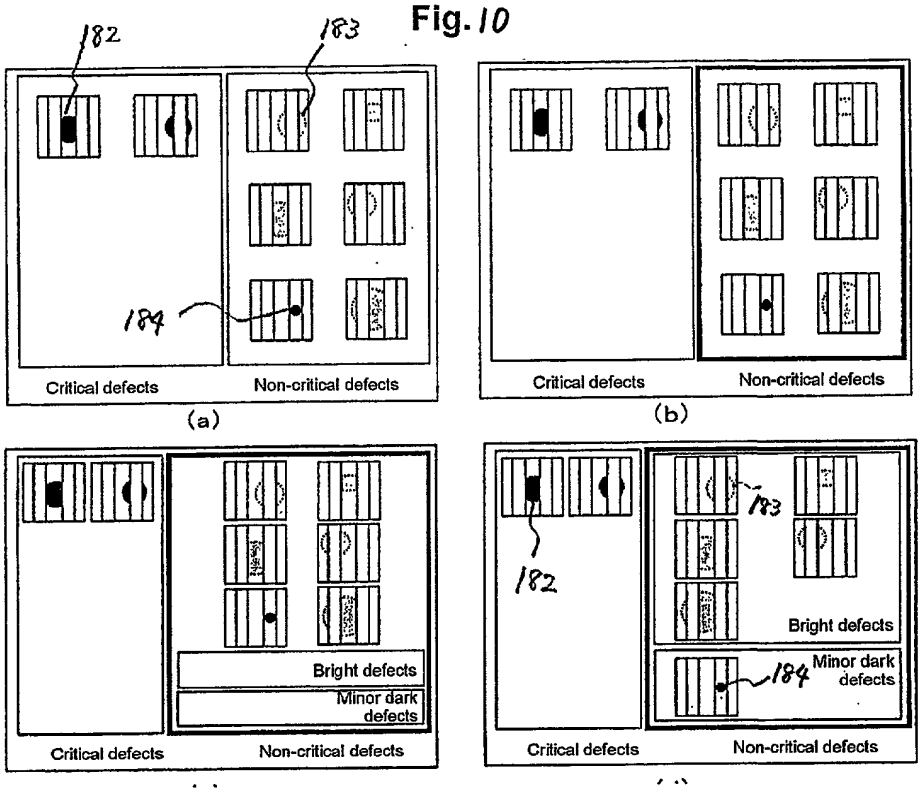


Fig. 11

160 Defect number	161 Chip coordinates	162 Defect coordinates	163 Sampling flag	164 Image name	165 Test result	174 Image classification
1	(2,0)	(ΔX1, ΔY1)	0		G	G
2	(0,1)	(ΔX2, ΔY2)	0		G	G
3	(1,1)	(ΔX3, ΔY3)	1	image3	N	N
4	(2,1)	(ΔX4, ΔY4)	1	image4	N	N
5	(0,2)	(ΔX5, ΔY5)	0		G	G
6	(1,2)	(ΔX6, ΔY6)	1	image6	G	G
7	(1,2)	(ΔX7, ΔY7)	1	image7	G	G
8	(1,2)	(ΔX8, ΔY8)	1	image8	G	G
9	(2,2)	(ΔX9, ΔY9)	(0)	image9	N	N
10	(2,2)	(ΔX10, ΔY10)	1	image10	N	N
11	(3,2)	(ΔX11, ΔY11)	0		G	G
12	(1,3)	(ΔX12, ΔY12)	0		N	N

Fig. 12

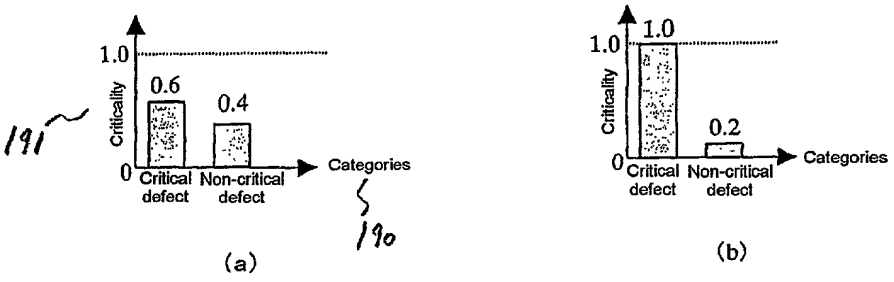

1.0
Criticality
0.6
0.4
0
Critical defect
Non-critical defect
Categories
191
190
(a)
1.0
1.0
Criticality
1.0
0.2
0
Critical defect
Non-critical defect
Categories
(b)

Fig. 13

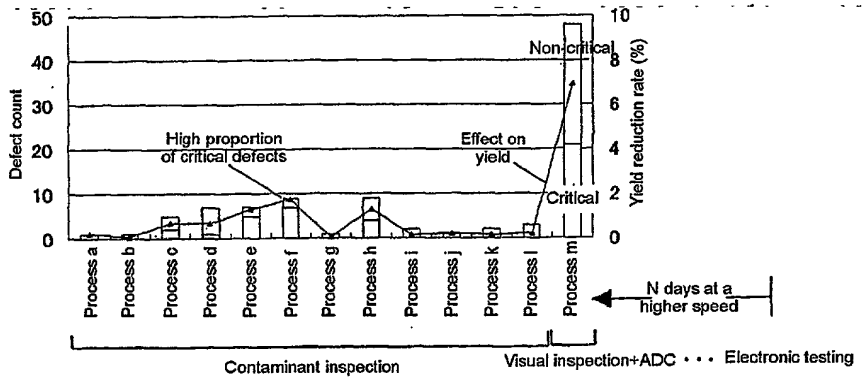

Defect count
50
40
30
20
10
0
Yield reduction rate (%)
10
8
6
4
2
0
Non-critical
High proportion of critical defects
Effect on yield
Critical
Process a
Process b
Process c
Process d
Process e
Process f
Process g
Process h
Process i
Process j
Process k
Process l
Process m
N days at a higher speed
Contaminant inspection
Visual inspection+ADC • • • Electronic testing

Fig. 14

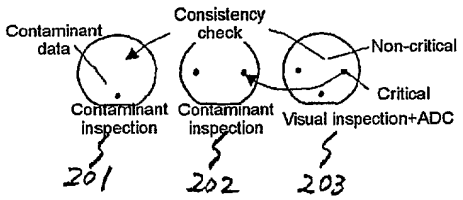
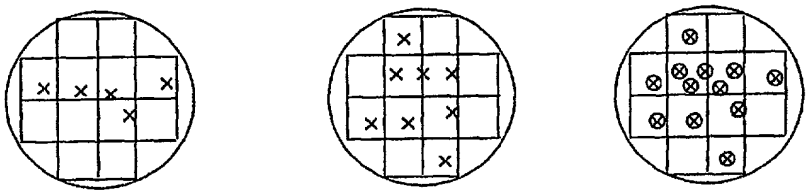

Contaminant data
Consistency check
Non-critical
Critical
Contaminant inspection
Contaminant inspection
Visual inspection+ADC
201
202
203

Fig. 15


Inspection results 2
204
Inspection results 5
205
Sampling
206